REMARKS

Summary of the Amendment

Upon entry of the above amendment, the specification, drawings, and claims 26 and 32 will have been amended. Additionally, claims 42-44 will have been added. Accordingly, claims 17-44 will be pending, with claims 17, 37 and 42 being in independent form.

Summary of the Official Action

In the Office action, the Examiner rejected claims 17 and 20-41 over the applied art of record. On the other hand, the Examiner failed to indicate the status of claims 18 and 19, i.e., these claims were not rejected, nor indicated to contain allowable subject matter. By the present amendment and remarks, Applicant submits that the rejections have been overcome, and respectfully requests reconsideration of the outstanding Office Action and allowance of the present application.

The Examiner cannot properly make the next action Final

Inasmuch as the Examiner has apparently failed, in the instant Official action, to consider the merits of at least claims 18 and 19, Applicant submits that the next action cannot be made final. Accordingly, Applicant respectfully requests that the Examiner carefully

Interview of August 26, 2003

Applicant appreciates the courtesy extended by Examiner Irakli Kiknadze in the interview of August 26, 2003. In that interview, Applicant's representative discussed, among other things, amending Fig.1 to show that the sealing washer is represented with reference number 5 and that the specification would be amended consistent with this change.

Applicant's representative also pointed out that the pending claims recite a diamond window whose thickness is in the range of 300 μm to 2000 μm, i.e., 0.3 mm to 2 mm. On the other hand, the diamond window of IMAI is disclosed as being a maximum of 0.03 mm. Specifically, IMAI discloses at col. 4, line 25 (and col. 5, lines 58-59) that diamond layer 1 can have a thickness of up to 10 μm, i.e., 0.01 mm. Moreover, col. 7, lines 30-32 discloses that the diamond reinforcing layer/members 2 can have a thickness (or height) of up to 20 μm, i.e., 0.02 mm. Thus, both diamond thickness are disclosed as being no greater than 30 μm, i.e., 0.03 mm.

Next, it was explained that while Applicant does not dispute that SAHORES discloses a window 3 and/or shell 4 whose thickness is disclosed as being in the range of 1 and 2 mm, it is clear that SAHORES never suggests that a diamond material would function properly in this thickness range. It was specifically pointed out that SAHORES merely discloses a beryllium window 3 (see col. 4, lines 32-33). Moreover, the language of col. 4, lines 9-11

radiation" cannot properly be interpreted to encompass a diamond material because a diamond material in the recited thickness range would have been ruled out due to increased absorption. Indeed, this is clearly explained in paragraph [0004] of Applicant's specification.

Next, it was explained that Applicant has discovered that a diamond window can be made significantly thicker than that of the prior art. This is explained on paragraphs [0010] and [0011] of Applicant's specification.

Finally, Applicant pointed out that the other applied documents similarly lack a diamond window with the recited thickness.

In response, the Examiner agreed to reconsider the rejections if such arguments and explanations were presented in a response.

Traversal of Rejections Under 35 U.S.C. § 103(a)

Applicant traverses the rejection of claims 17, 20-26, 32, 33 and 35-41 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 4,159,437 to SAHORES in view of U.S. Patent No. 5,173,612 to IMAI et al.

The Examiner acknowledged that SAHORES lacks a diamond window with a thickness in the range of 300 μm to 2000 μm. However, the Examiner explains that IMAI discloses a diamond window. Accordingly, the Examiner concluded that it would have been

In support of this conclusion, the Examiner explains that such a combination would achieve "high transparency for X-rays for the X-ray window with high flatness, and high strength." The Examiner also suggests that the use of diamond is merely an obvious matter of selecting a known material.

Applicant also traverses the rejection of claims 27-29 under 35 U.S.C. § 103(a) as being unpatentable over SAHORES in view of IMAI and further in view of U.S. Patent No. 4,622,688 to DIEMER et al.

Applicant additionally traverses the rejection of claims 30 and 31 under 35 U.S.C. § 103(a) as being unpatentable over SAHORES in view of IMAI and further in view of U.S. Patent No. 5,809,106 to KITADE et al.

Applicant additionally also traverses the rejection of claim 34 under 35 U.S.C. § 103(a) as being unpatentable over SAHORES in view of IMAI and further in view of U.S. Patent No. 6,241,651 to SMITH et al.

The Examiner additionally acknowledged that SAHORES/IMAI lacks an intermediate layer, a temperature sensor, and an anode material comprising tungsten. However, the Examiner explains that DIEMER discloses the use of an intermediate layer, that KITADE discloses a temperature sensor, and that SMITH discloses a tungsten anode material. Accordingly, the Examiner concluded that it would have been obvious to modify the device

Applicant respectfully traverses each of these rejections and the Examiner's assertions.

Applicant respectfully submits that no proper combination of these documents discloses or suggests, inter alia, an x-ray anode for microfocus sources comprising *a diamond window having a thickness in a range of 300 μm to 2000 μm*, and *an anode material being located on said diamond window*, as recited in independent claim 17, and inter alia, an x-ray anode formed by a process comprising *locating an anode material on a diamond window having a thickness in a range of 300 μm to 2000 μm,* as recited in independent claim 37.

As discussed in the Interview, SAHORES clearly lacks any disclosure or suggestion with regard to a diamond window whose thickness is in the range of 300 μm to 2000 μm, i.e., 0.3 mm to 2 mm. To the contrary, SAHORES merely discloses a truncated cone window 3 and/or shell 4 whose thickness can be in the range of 1 and 2 mm. Although, this document indicates that the shell 4 "may be made out of any material which is transparent to X-ray radiation" (see 4, lines 9-11), there is no suggestion whatsoever of using diamond. Moreover, there is no teaching or suggestion of modifying the geometric arrangement of the window, i.e., from a truncated cone to a flat window with reinforcements, or vice versa. Nor can such language properly be interpreted to encompass a diamond material since a diamond material in the recited thickness range would have been ruled out prior to the instant

of the instant specification. There it states that thick diamond windows have been ruled out in the prior art because of, e.g., increased absorption.

Applicant emphasizes that SAHORES never suggests that a diamond material would function properly in this thickness range and merely discloses a device whose disadvantages have been recognized in the instant specification. Moreover, it should be apparent to the Examiner that SAHORES discloses a beryllium window 3 (see col. 4, lines 32-33). On the other hand, Applicant has explained on paragraph [0003] of the instant specification that such a material is disadvantageous and that it "should be avoided as far as a window material."

IMAI similarly lacks any disclosure to a diamond window whose thickness is in the range of 300 μm to 2000 μm, i.e., 0.3 mm to 2 mm. To the contrary, the diamond window of IMAI is disclosed as being a maximum of 0.03 mm. As the Examiner must recognize, IMAI discloses at col. 4, line 25 (and col. 5, lines 58-59) that diamond layer 1 can have a thickness of up to 10 μm, i.e., 0.01 mm. Moreover, col. 7, lines 30-32 discloses that the diamond reinforcing layer/members 2 can have a thickness (or height) of up to 20 μm, i.e., 0.02 mm. Thus, both diamond thickness are disclosed as being no greater than 30 μm, i.e., 0.03 mm. A value of 0.03 mm is clearly well outside the recited thickness range of 300 μm to 2000 μm, i.e., 0.3 mm to 2 mm.

the window 3 of SAHORES is a relatively thick truncated cone of beryllium, whereas IMAI discloses a relatively thin flat diamond window which "excels in the flatness" (see col. 8, lines 9-10). Clearly, one of ordinary skill in the art would not be motivated to substitute the thin flat diamond window of IMAI with the much thicker truncated cone of SAHORES. At the very least, such a modification would clearly not produce a flat diamond window which "excels in the flatness", and thus would not operate in the manner intended by IMAI. To the same extent, the art of record provides no motivation or rational to substitute the truncated cone of SAHORES with a flat diamond window of IMAI, as suggested by the Examiner. Nor do either of these documents suggest that diamond and beryllium are inter-changeable in their specific arrangements. Therefore, Applicant submits that the asserted combination of documents must be the result of impermissible hindsight based on Applicant's disclosure.

Applicant further submits that the documents themselves teach away from the asserted combination or modification. For example, col. 2, lines 31-33 of IMAI makes clear that a thick diamond film is not desirable because of its increased absorption, even though it would have improved mechanical strength. Moreover, SAHORES fails to even mention diamond as an optional material for the window.

Indeed, the Examiner's motivation statement is revealing in its failure to point to any disclosure in the applied art to support such a modification. In the Office Action, the

taught by IMAI on the device of SAHORES and that such a combination would achieve "high transparency for X-rays for the X-ray window with high flatness, and high strength." However, what the Examiner fails to consider is that IMAI achieves this high transparency with a *flat* diamond window which is in the form of a film that is reinforced with crosspieces (see col. 4, lines 24-33) and whose a maximum thickness is 0.03 mm, not with *a truncated cone* that is 1 to 2 mm thick, as disclosed by SAHORES. Moreover, the Examiner has never explained what would motivate one of ordinary skill in the art to replace a truncated cone of beryllium with a flat disk of diamond which is at least thirty-three times thinner. Nor has the Examiner provided any valid reason or motivation for replacing a truncated cone of beryllium with a thickness of between 1 and 2 mm with a flat disk of diamond having a thickness of 0.03 mm.

Accordingly, Applicant submits that even if SAHORES and IMAI were properly combined, which Applicant submits they cannot be, they would nevertheless lack features which are recited in at least independent claims 17 and 37. Moreover, each of these documents fails to disclose or suggest the requisite motivation or rationale for combining these documents in the manner asserted by the Examiner. Finally, Applicant submits that IMAI fails to cure the deficiencies lacking in SAHORES, and vice versa.

With regard to DIEMER, KITADE and SMITH, Applicant notes that these documents

x-ray anode for microfocus sources comprising *a diamond window having a thickness in a range of 300 μm to 2000 μm*, and *an anode material being located on said diamond window*, and/or an x-ray anode formed by a process comprising *locating an anode material on a diamond window having a thickness in a range of 300 μm to 2000 μm.* These documents also fail to suggest the inter-changeability of diamond and beryllium as the window material.

Accordingly, Applicant also submits that even if these documents were properly combined, which Applicant submits they cannot be, they would nevertheless lack features which are recited in at least independent claims 17 and 37. Moreover, each of IMAI, DIEMER, KITADE, and SMITH fails to disclose or suggest the requisite motivation or rationale for combining these documents in the manner asserted by the Examiner. Finally, Applicant submits that IMAI, DIEMER, KITADE and SMITH fails to cure the deficiencies lacking in SAHORES, and vice versa.

Applicant reminds the Examiner of the guidelines identified in M.P.E.P section 2141 which state that "[i]n determining the propriety of the Patent Office case for obviousness in the first instance, it is necessary to ascertain whether or not the reference teachings would appear to be sufficient for one of ordinary skill in the relevant art having the reference before him to make the proposed substitution, combination, or other modification." *In re Linter*, 458 F.2d 1013, 1016, 173 USPQ 560, 562 (CCPA 1972).

or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988); *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992)."

Moreover, it has been legally established that "[t]he mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination. *In re Mills*, 916 F.2d 680, 16 USPQ2d 1430 (Fed. Cir. 1990) .... Although a prior art device "may be capable of being modified to run the way the apparatus is claimed, there must be a suggestion or motivation in the reference to do so." 916 F.2d at 682, 16 USPQ2d at 1432.). See also *In re Fritch*, 972 F.2d 1260, 23 USPQ2d 1780 (Fed. Cir. 1992) (flexible landscape edging device which is conformable to a ground surface of varying slope not suggested by combination of prior art references).

Additionally, it has been held that "[a] statement that modifications of the prior art to meet the claimed invention would have been " 'well within the ordinary skill of the art at the time the claimed invention was made' " because the references relied upon teach that all aspects of the claimed invention were individually known in the art is not sufficient to establish a prima facie case of obviousness without some objective reason to combine the

1993)."

Thus, Applicant submits that there is no motivation or rationale disclosed or suggested in the art to modify either document in view of the other in the manner asserted by the Examiner, i.e., to replace a thick truncated cone of beryllium window with a thin reinforced film of diamond. Nor does the Examiner's opinion provide a proper basis for making such a modification or combination, in the manner suggested by the Examiner. Therefore, Applicant submits that the invention as recited in at least independent claims 17 and 37 is not rendered obvious by any reasonable inspection of the disclosures of the applied prior art.

Finally, Applicant submits that claims 20-36 and 38-41 are allowable at least for the reason that these claims depend from an allowable base claim and because these claims recite additional features that further define the present invention. In particular, Applicant submits that no proper combination of the above-noted documents discloses or suggests: that said anode material comprises at least one of a metal, an alloy, and a plurality of layers of metal as recited in claim 20; that said anode material has a thickness between 1 μm and 25 μm as recited in claim 21; that said anode material has a thickness between 3 μm and 12 μm as recited in claim 22; that said anode material has a thickness of 6 μm as recited in claim 23; that said anode material at least partially covers said diamond window as recited in claim 24; that said anode material completely covers a surface of said diamond window as recited in

as recited in claim 26; that the x-ray anode further comprises an intermediate layer positioned between said anode material and said diamond window as recited in claim 27; that said intermediate layer comprises an adhesion-promoting layer as recited in claim 28; that said intermediate layer comprises a radiation filter as recited in claim 29; that the x-ray anode further comprises a temperature sensor as recited in claim 30; that said diamond window is structured and arranged as a temperature sensor as recited in claim 31; that said x-ray anode is structured and arranged for use in an x-ray microscope as recited in claim 32; that said x-ray anode is structured and arranged for use in an x-ray unit as recited in claim 33; that said anode material comprises tungsten as recited in claim 34; that said anode material is located on said diamond window by physical vapor deposition as recited in claim 35; that said diamond layer is formed on an auxiliary substrate by chemical vapor deposition as recited in claim 36; that said anode material is located on said diamond window by physical vapor deposition as recited in claim 38; that before the anode material is located on said diamond window, said process further comprises forming said diamond window by depositing a polycrystalline diamond layer onto an auxiliary substrate and removing the auxiliary substrate from the diamond window as recited in claim 39; that said polycrystalline diamond layer is deposited on said auxiliary substrate by chemical vapor deposition as recited in claim 40; and that said anode layer at least partially covers a surface of said diamond window as recited in

Accordingly, Applicant requests that the Examiner reconsider and withdraw the rejection of the above-noted claims under 35 U.S.C. § 103(a) and indicate that these claims are allowable.

New Claims are also Allowable

Applicant submits that the new claims are also allowable over the applied art of record. In particular, Applicant submits that claims 42-44 recite a combination of features which are not disclosed or suggested by the Applied art of record.

Accordingly, Applicant respectfully requests consideration of these claims and further request that the above-noted claims be indicated as allowable.

CONCLUSION

Applicant respectfully submits that each and every pending claim of the present invention meets the requirements for patentability under 35 U.S.C. § § 112, 102 and 103 and respectfully requests the Examiner to indicate allowance of each and every pending claim of the present invention.

In view of the foregoing, it is submitted that none of the references of record, either taken alone or in any proper combination thereof, anticipate or render obvious the

record have been discussed and distinguished, while significant claimed features of the present invention have been pointed out.

Further, any amendments to the claims which have been made in this response and which have not been specifically noted to overcome a rejection based upon the prior art, should be considered to have been made for a purpose unrelated to patentability, and no estoppel should be deemed to attach thereto.

The Commissioner is hereby authorized to charge any fees necessary for consideration of this amendment to deposit account No. 19-0089.

Should there be any questions, the Examiner is invited to contact the undersigned at the below listed number.

Respectfully submitted,
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